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BIOLOGICAL AND MICROSCOPICAL DEPARTMENT

OF THE

ACADEMY OF NATURAL SCIENCES.

On the evening of March 28th, 1868, a meeting of gentlemen interested in the organization of a Microscopical Society was held at the office of Dr. James Tyson, at which sixteen were present, while written or verbal communications signifying sympathy with the project were presented from at least as many more.

Dr. R. S. Kenderdine was called upon to preside and Dr. Tyson to act as Secretary. A letter from Prof. Jos. Leidy was read, urging the advantages of working under the Biological Department of the Academy of Natural Sciences. Such, or a similar plan of organization met with approval, and a committee, consisting of Drs. H. C. Wood, Jos. Leidy, Wm. Pepper, J. H. McQuillen and James Tyson, was appointed to take into consideration the propriety and feasibility of forming a *Microscopical* Department of the Academy of Natural Sciences, and to report at a meeting to be held Saturday evening, April 4th, at the same place.

April 4th, 1868.

President, R. S. KENDERDINE, M. D., in the Chair.

Seventeen gentlemen present.

The Committee appointed at the last meeting reported, "It having been strongly urged by members of the Committee and influential members of the Academy of Natural Sciences, that we should not organize a purely Microscopical Department, we consider that the objects of the meeting will be most successfully attained by forming a Department or Section to be known as The Biological and Microscopical Department of the Academy of Natural Sciences of Philadelphia, which will combine the objects of the existing Biological Department and a Microscopical Society, in a manner to be determined in accordance with Chap. XIII of the By-Laws of the Academy, On the Creation and Government of Departments."

This report was adopted and the Committee continued to carry out its report.

MEETING OF BIOLOGICAL DEPARTMENT OF THE ACADEMY.

April 16th, 1868.

Director, Jos. Leidy, M. D., in the Chair.

Six members present.

The Director stated the object of the meeting to be to take into consideration the revival of the Biological Department of the Academy, and its union with a proposed Microscopical Department.

After some discussion, it was voted that a committee of three, including the Director, be appointed to confer with the Microscopical Society and point out the advantages to accrue from the proposed union, and afterwards to take such action in the Academy as shall be required to bring about such union. Drs. Leidy, Mitchell and J. A. Meigs were appointed.

Adjourned to meet on 1st Monday in May.

April 25th, 1868. *Proposed Microscopical Society.*

President, R. S. Kenderdine, M.D., in the Chair.

Twenty-three gentlemen present.

The Committee reported that on April 18th, 1868, they met a Committee of the Biological Department of the Academy, consisting of Drs. Jos. Leidy, Dr. S. W. Mitchell and J. A. Meigs, and as the result of this conference, were empowered to offer the following propositions to the meeting, if, in accordance with the resolutions of the first meeting, it be deemed desirable to unite with the Biological Department of the Academy.

I. The name of the present Biological Department shall be changed to Biological and Microscopical Department.

II. All microscopic apparatus and preparations now owned by the Biological Department will be freely available to the new Department.

III. The extensive microscopic library of the Academy will be accessible to them, and the purchase of new books can be secured from a fund provided for the purpose.

IV. Meetings can be held in the Hall of the Academy at whatever time appears desirable to the members of the Department, except the evenings of the stated meetings of the Academy, and the order of business can be arranged as desired.

V. A motion shall be urged upon the Academy that the amount of entrance fee and the annual contribution for the first year, of new members joining the Academy for the sake of becoming members of this Department, shall be voted as an appropriation to the Department.

On motion of Dr. Wm. Pepper, it was voted that if the advantages above detailed are granted by the Academy, it is deemed desirable that the gentlemen wishing to form a Microscopical Society unite with the body known as the Biological Department of the Academy, under the title of the Biological and Microscopical Department of the Academy of Natural Sciences of Philadelphia.

It was also voted that a committee of three be appointed to carry out the resolution and to take proper steps to have those gentlemen not members of the Academy made such. The Chair appointed Prof. F. G. Smith, Drs. H. C. Wood and W. Pepper.

Adjourned until called by the officers of the Biological Department.

Biological Department, May 4th, 1868.

Vice Director, S. W. MITCHELL, M. D., in the Chair.

Three members present.

The following gentlemen, also present, members of the Academy of Natural Sciences, on complying with the By-Laws of the Academy on the subject of Departments, were also declared members:—Wm. Pepper, M. D., H. M. Bellows, M. D., F. W. Lewis, M. D., Isaac Norris, M. D., James Tyson, M. D., Harrison Allen, M. D., H. C. Wood, M. D., R. S. Kenderdine, M. D., T. C. Stellwagen, M. D., J. H. McQuillen, M. D., J. G. Hunt, M. D., C. N. Peirce, D. D. S., C. A. Kingsbury, D. D. S.

Eleven gentlemen interested in the proposed Microscopical Society, but not members of the Academy, were also present by invitation.

Dr. J. H. McQuillen exhibited a number of sections of human teeth which he had prepared, demonstrating the *interglobular spaces in dentine*, and also made some extended remarks descriptive of his investigations in this direction, which he proposes to publish in the Proceedings.

Biological Department, May 19th, 1868.

The Director, JOS. LEIDY, M. D., occupied the Chair.

Thirteen members present; eleven, not members, present by invitation.

Dr. Tyson exhibited specimens of black crystalline forms, generally rhomboidal, obtained from fecal discharges, and which presented the characters of *hæmin* crystals, as described by Virchow in "Cellular Pathology."

Dr. S. W. Mitchell having recently studied the life of the rattlesnake, remarked, with regard to the growth of their rattles, that they are produced at all times, even when the reptile has been long deprived of food, and that they are not produced one in each year of the life of the reptile, as commonly thought.

Biological Department, June 1st, 1868.

Director, JOS. LEIDY, M. D., in the Chair.

Sixteen members present, also nine gentlemen, proposed members.

The following were declared members of the Department:—

Jno. Neill, M. D., T. L. Buckingham, D. D. S., R. W. Hargadine, M. D., E. L. Hewitt, D. D. S., Aug. F. Müller, M. D., Edw.

Rhoads, M. D., W. H. Trueman, D. D. S., James Truman, D. D. S., Chas. Shaeffer, M. D., Henry C. Chapman, M. D., W. W. Keen, M. D., W. Lehman Wells, M. D., T. H. Andrews, M. D., Geo. Pepper, M. D., D. Murray Cheston, M. D., Horace Williams, M. D., Herbert Norris, M. D., Chas. Bullock, W. L. McFadden, Joseph Zentmayer, W. H. Walmsley, T. W. Starr, Horace B. Hare, M. D., Prof. Robt. E. Rogers, M. D., and F. F. Maury, M. D.

The resignations of Messrs. McAllister, Atlee, Wilcocks and Ziegler were read and accepted.

Dr. J. H. McQuillen exhibited longitudinal and transverse sections, prepared by himself, illustrating the anatomy of the poison fangs of the rattlesnake. The fangs were from the head of a rattlesnake furnished to him by Dr. S. W. Mitchell.

Biological Department, June 16th, 1868.

WM. PEPPER, M. D., in the Chair.

Twenty-five members present.

Drs. J. L. LeConte, J. H. Packard and S. B. Howell were declared members of the Department.

The resignations of Mr. Constant Guillou and Drs. A. Hewson and Henry Hartshorne were read and accepted.

Dr. W. W. Keen exhibited some injected preparations mounted in sections, by Prof. Thiersch of Leipzic. Some of these were marvels of execution, more particularly as to the extent of the sections, being those of an entire kidney of a cat and rabbit, and similarly extensive tissues. They were mounted in balsam, and exhibited, for the most part vascular arrangement only.

At the election of officers this evening for the remainder of the year 1868, the following were chosen:—

Director, Wm. Pepper, M. D.
Vice Director, J. Gibbons Hunt, M. D.
Recorder, James Tyson, M. D.
Corresponding Secretary, J. H. McQuillen, M. D.
Conservator, Herbert Norris, M. D.
Treasurer, C. N. Pierce, D. D. S.

July 6th, 1868.

Director, WM. PEPPER, M. D., in the Chair.

Twenty-three members present.

Dr. H. C. Wood exhibited a section through the root of the *American mistletoe*, showing the intimate conjunction of the woody tissue of the parasite with that of its foster mother, as well as the distinctness of the two, and remarked on the fact that the green leaved phanerogamic parasite thus pierced into the region of the crude sap, while the tawny, scale leaved, such as the *beech drop*, are only capable of nourishing themselves with the elaborated sap, and that therefore they merely pierced the bark of their victim, their roots ramifying through the cambium layer.

Dr. J. G. Hunt remarked:

It is well known to botanists that in the pitcher of *Nepenthes distillatoria* there are numerous glands lining its internal surface, and extending from the extreme bottom up nearly to the middle of the pitcher. This system of glands has been described by Treviranus but never correctly figured that I am aware of. But if we examine with a common lens, the frill, or thickened edge surrounding the top of the pitcher, looking carefully along the inner and lower margin, we may detect numerous little apertures, leading into short canals, and terminating in as many large cylindrical glands which lie around the top of the pitcher like guns around a fortification. These glands lie imbedded in a parenchyma, made up almost entirely of large spiral cells, and this would seem to indicate considerable activity in their function, which, no doubt, is to pour down a multitude of trickling rills into the cavity of the pitcher. I am not aware that botanists have alluded to these glands before, and it is probable analogous ones exist in the other species of this genus.

Dr. Hunt also exhibited preparations illustrating the anatomy of *Drosera rotundifolia*, and remarked that

The glands terminating the filaments growing on the leaves are beautiful structures when rendered sufficiently transparent for observation. A spiral vessel traverses the centre of each filament and terminates at its free end in several large, elongated spiral cells. Around, and entirely enclosing this cluster of spiral cells, many columnar cells filled with granules are arranged, their long diameters pointing outwards, and a delicate epidermis envelops all. If the mature leaf be severed from the plant and placed in favorable conditions, adventitious buds will be formed on it, and thus a crop of young Droseras may be obtained. We have examined this plant in all its stages of growth, under lenses, and without them, and failed to detect any evidence of irritability, and while it doubtless does *catch* flies and other small objects by means of the adhesive liquid on the glands, it would seem that the conclusion drawn from this fact, namely, that the Drosera needs animal food *thus* for its growth, is, perhaps, premature. Has such fact ever been proved?

July 20*th*, 1868.

Vice-Director, J. G. HUNT, M. D., in the Chair.

Sixteen members present.

Donations.—A preparation of epithelial cancer of the larynx, presented by Dr. J. J. Woodward.

A photograph of acarus sacchari.

An official communication was received from the Recording Secretary of the Academy of Natural Sciences, containing an abstract of the minute of a recent meeting of the Academy, at which the following by-law was passed after the third reading.

"Art. xxi, of Chap. XIII. The Department A shall be denominated the Biological and Microscopical Department of the Academy of Natural Sciences of Philadelphia." Thus authorizing officially the new title of the Department.

BIOLOGICAL AND MICROSCOPICAL DEPARTMENT.

Aug. 3*d*, 1868.

MR. CHAS. BULLOCK in the Chair.

Eleven members present.

Aug. 17*th*, 1868.

Director, WM. PEPPER, M. D., in the Chair.

Fifteen members present.

Dr. J. Gibbons Hunt exhibited and described an improved Section instrument.

A brass tube, two inches long and three-fourths of an inch in diameter, is closed at one end; a circular brass plate two inches in diameter attached to the other end, and ground properly flat, forms the surface to guide the razor. Into this tube fits another, which is worked up or down by a screw working in a thread cut in the bottom of the outside tube. A slot cut *through the upper* end of the *outer tube* affords room for a lateral binding-screw, which is *attached to* and *carried* by the *inner tube*. The binding-screw presses against a moveable tongue of metal armed at the upper and inner side with minute points. On the opposite side of the inner tube are also points designed to hold an object more securely. The advantages of this improvement are obvious. It is cheap, and is peculiar in really answering the purpose for which it is made.

Cork is *unfit* for holding objects in a section instrument; some *firm* vegetable, such as a turnip or potato, for all *very delicate* preparations being far better.

Sept. 7th, 1868.

Director, WM. PEPPER, M. D., in the Chair.

Seventeen members present.

Dr. Wm. Pepper read a paper, illustrated by microscopical preparations, "On the action of phosphorous in poisonous quantities upon the animal economy."

See American Journal of the Med. Sciences, April, 1869.

George Roberts M. D., and Ferdinand A. Hassler, M. D., were chosen members of the Department.

Sept. 21*st*, 1868.

Director, W. PEPPER, M. D., in the Chair.

Twenty members present.

A complete set of photographs of the 19 bands of Nobert's most recent test plate, the last four showing spectral bands only, were presented by the Surgeon General U. S. Army, through Dr. J. J. Woodward.

DR. LEIDY observed that having noticed in the recent edition of Gray's Manual of Botany, the description of a species of Wolffia, for the first time published as occurring in the United States, he was led to seek for it in the vicinity of Philadelphia, under the impression that he had long been familiar with a plant of the kind, but without knowing its true character. He was successful in his search, having found it growing abundantly in a ditch skirting the road near the Delaware River, below the built up portion of the city. It is accompanied by a profusion of *Lemna polyrrhiza* and *L. minor*.

Dr. Leidy exhibited specimens of the plant in a glass vial and also beneath the microscope. This, the smallest and simplest of all the true flowering plants, appears to be the *Wolffia Columbiana* of Karsten, to which the United States plant of other localities has been referred in Gray's Manual. The description in the latter is very brief, and the original is not accessible in our library. The plant is larger than indicated in Gray, and may be looked upon as a variety. It was described as follows:

The frond is oval or nearly globular, uniformly bright pea-green, smooth or slightly muricate, shining. Plant floating at the surface of the water, about two-thirds submerged with the long diameter horizontal. No distinctive appearance between the upper and lower surfaces. In a state of multiplication usually observed with the new frond projecting from within one end of

the parent, of all sizes nearly, to that of the latter itself. When the new frond is separated, the parent is observed to appear truncate at the pole of separation with a cup-like concavity, surrounded by a thin hyaline margin, which is sometimes slightly everted. After the establishment of the cup, a succession of new fronds appear to be produced from it, and may be observed in different fronds in all stages of growth. The new fronds are slightly pedicellate, and the offspring of these appear to originate close to the pedicel. Size of the full grown frond from $\frac{1}{3}$ to $\frac{1}{2}$ a line in depth and breadth, with the length slightly greater.

Outer epidermis composed of hexagonal cells in outline, with an abundance of chlorophyl grains adherent to the interior surface. Cells of the margin of the cup for two or three rows twice the breadth but not more than half the depth of the others. Stomata remarkably few; not more than from two to four observed in a frond. Interior of the frond occupied with large spheroidal cells, three times the diameter of those of the epidermis. Air occupies many of the interior cellular interspaces. Towards the point of attachment of the new frond, the cells of the parent diminish in size and these contain some brownish coloring matter.

The flowers and fruit of *W. Columbiana*, as observed in Gray's Manual, have not been seen in the United States, but the fruiting plant, it is also stated, has been recently discovered by Karston, in Venezuela. No flowers or fruit were detected in the Philadelphia plant.

Dr. J. H. McQuillen performed some experiments on animals with nitrous oxide before the Department, prior to which

He remarked that every one present is no doubt aware that the recent introduction of nitrous oxide as an anæsthetic in England, has been much opposed by a number of prominent medical men there, particularly Drs. B. W. Richardson and A. E. Sansom, both of whom have devoted years to the careful study of anæsthetics, and, on account of their observations, experiments and contributions to the literature of anæsthetics, have come to be regarded "as of authority" in such matters; and their combined opposition appears to have had considerable effect upon the medical profession, judging from the comments in the medical journals, and the reports of proceedings of medical societies opposing its use; but the dental profession of England, aware of the remarkable exemptiom from fatality which has attended the use of nitrous oxide in America—frequently in the hands of most ignorant persons—have determined to give the agent a fair trial. The result is not an uncertain one, and before another year passes by nitrous oxide, in the hands of the progressive members of the dental profession in Great Britain, will almost entirely supercede, as in this country, the use of ether and chloroform in the extraction of teeth, and there is no reason why it should not be employed in the minor and capital operations of general surgery.

Dr. Richardson, in addition to his opposition to the use of nitrous oxide as an agent that "had caused death in the human subject" (making this assertion notwithstanding the fact that, in 100,000 cases or more in which it has been employed in America, no fatal case can justly be attributed to it as the direct cause), said at a meeting of the Medical Society of London, that "*on animals it was so fatal that, with the utmost delicacy in its use, it was a critical task thoroughly to narcotize an animal with the gas without actually destroying life. In some cases, also, animals died after recovering from the insensibility.*"

In accounting for this fatality in man and animals, nitrous oxide has been denied the possession of anæsthetic properties, and the results obtained attributed to *asphyxia*, due to "suspension of oxygenation," as in cases of death from the inhalation of the fumes of charcoal or carbonic acid gas, rather than impressions made upon the brain directly by the agent. It is somewhat singular to have such an explanation offered in connection with a substance which supplies an excess of oxygen to the blood. It is not my intention, however, this evening, to enter into the consideration of how nitrous oxide acts upon

the system; but with a view of testing the accuracy of the statement quoted which, as you will observe, was made in the most decided and emphatic manner, without the slightest limitation or reservation to repeat a series of experiments on some animals in your presence to whom I administered nitrous oxide before the members of the Odontographic Society, three weeks since.

The gas was then given as follows:

1st experiment.—A white rabbit, in good condition, was placed upon the table, held by assistants, and Barker's flexible india-rubber hood adjusted over the face of the animal, so that it could inhale the gas directly from the gum-bag. A valve in the inhaler admitted of the ingress of nitrous oxide gas to the lungs, and of the egress of the carbonic acid from them. After some little resistance, the rabbit became sensibly affected by the gas, in a minute and a quarter fell over on its side perfectly motionless, so completely narcotized that, on being held up by the ears, feet, or tail, it made no resistance, and would have been taken for dead but for slight respiration and the evident movements of the heart on applying the hand to the chest. In two minutes and ten seconds it revived, and sprang from the table to the floor, apparently unaffected by the experience it had just passed through.

2d experiment.—Another white rabbit was treated in the same manner as the first, with the exception that the gas was applied for a longer period, (1m. 20 sec.), and the animal was much slower in recovering from the effects. Several of the gentlemen, indeed, thought that life had become extinct, but five minutes after the induction of narcosis, it was running about on the floor with its companion.

3d experiment.—A kitten, about four months old—which had been suffering from the distemper, refusing solid food during the preceding five weeks, and on drinking milk almost invariably vomited it—was then treated as the other animals had been. The resistance to the inhalation of the gas was much greater on her part, and the urinary organs were so much affected that quite a profuse discharge of urine occurred. In 1 m. 30 sec. the animal was completely narcotized, and remained in an inanimate condition for 1 m. 10 sec., when it gradually revived, and appeared none the worse for the free supply of the gas.

4th experiment.—The gas was then introduced into a bell-glass receiver over a water bath, and a frog placed under the glass; but apparently owing to the rapidity with which water absorbs nitrous oxide, the animal remained there for more than half an hour unaffected by it.

5th experiment.—Another frog was placed in a wet bladder, the opening of which was tied tightly around the nozzle of the inhaler, and the gas passed into the bladder; in 3 m. 33 sec. the frog was lying on his back perfectly motionless, the translucence of the bladder affording a view of his position and condition. On untying the string and taking the animal out of the bladder, the access of fresh air revived it at once, and it jumped from the table with its usual vigor.

These experiment occupied about one hour, and some idea may be gained of the freedom with which the agent was administered to the animals by the fact that about forty gallons of gas were used up. At the close of the evening, when the meeting adjourned, the animals were perfectly comfortable.*

Mr. Chas. Bullock remarked that the impression so commonly held as to the effect of the continued inhalation of oxygen has been recently shown to be erroneous, and suggested the possibility that the varying effects might be due to allotropic states, in one of which,

* All of these animals have been under my daily supervision during the past three months, since the performance of the experiment, and none of them have manifested any discomfort, but, on the contrary, are in a perfectly healthy condition, the kitten in particular having improved so much under the remedy that, in a day or so after inhaling the gas, it partook freely of its food, and has been quite active and playful ever since.

the absorption of a larger quantity of oxygen being at times permitted, death resulted; and at other times, in an opposite state of the gas in which none was absorbed, no harm resulted.

Dr. H. C. Wood stated that he had known the administration of nitrous oxide gas to a patient suffering with uterine colic to fail to produce anæsthesia.

Richard K. Betts was elected a member of the Department.

Oct. 5th, 1868.

Director, WM. PEPPER, M. D., in the Chair.

Twenty-seven members present.

PROF. LEIDY directed attention to a specimen of a sponge which had been for many years in the Museum of the Academy, and had been presented by the late Dr. R. E. Griffith, who obtained it in the Island of Santa Cruz, W. I. It is especially interesting from its relationship with that most beautiful of all known sponges, the *Euplectella aspergillum*, and apparently also to that enigmatic body the *Hyalonema Sieboldii* of Japan. Specimens of both these were also exhibited. A beautiful one of the former, from the Philippines, presented to the Academy by Joseph Henry Craven. Several specimens of the *Hyalonema*, presented by Drs. Ruschenberger and Sinclair, consist of a twisted fasciculus or rope of long, coarse, translucent siliceous threads, partially invested with a brown verrucose membrane or bark. When the first specimen was presented to the Academy in 1860, (Pr. A. N. S. 1860, 85,) Prof. Leidy, as Curator, reported it as a part of a sponge with a parasitic polyp upon it. One of the specimens may have some significance as to the relation of the rope of spicules and its polyp covering. It has attached two shark eggs and part of the tendril-like cords of another. The tendrils clasp the rope and are also partially invested with the polyp crust. In the complete condition, the *Hyalonema* fasciculus appears always to be associated at one end with a sponge-mass. Originally described by Dr. R. E. Gray, the fasciculus was viewed as the axis of a coral of which the verrucose bark formed part, the warts constituting the polyps; and he supposed the fasciculus to grow as a parasite from the sponge, frequently seen in specimens attached to one of its extremities. This still appears to be the view of Dr. Gray, as announced in recent volumes of the Proceedings of the Zoological Society, etc.

Dr. Bowerbank views the siliceous rope, with its warty investment and the sponge mass at one end, altogether as the elements of a sponge. The warts or polyps of Dr. Gray he regards as the oscules of the sponge.

Schultze, in an elaborate memoir, (Die Hyalonemen) accompanied by beautiful plates representing the complete *Hyalonema*, as the result of his investigations, determines the sponge-mass and projecting siliceous rope to be together the elements of the sponge, and the warty investment of the rope to belong to a polyp to which he gives the name of *Polythoa fatua*. In the crusts or individual polyps he detected the arms filled with nettling cells.

Brandt views the siliceous rope and its investment as a polyp, and the sponge mass at one extremity as a parasite invading, ultimately to destroy the polyp.

Lastly, among the discordant views, Ehrenburg looks upon the siliceous rope as an "artificial product of Japanese industry."

Prof. L. continued, I shall not discuss this extraordinary difference of opinions among experts, but must confess that I view most favorably the theory that the sponge-mass and the siliceous rope together constitute the sponge *Hyalonema*, while the warty crust of the rope constitutes a parasitic compound polyp, the *Polythoa fatua* of Schultze.

The sponge from Santa Cruz, in its body and projecting fasciculi of siliceous threads, reminds one of the *Hyalonema* sponge with its siliceous rope, but the structure of the threads of the former more nearly resembles those of the

anchor threads of *Euplectella*. It is evidently a different sponge from either of those just named, and may be called *Pheronema*.

The body of the sponge is oblong ovoidal, with the narrower end upward, and with one side more prominent than the other. The lower extremity is rather cylindroid and rounded truncate. The upper extremity is conical, with a truncate apex presenting a large circular orifice. This is about 4 lines in diameter and is the exit of a canal which descends in the axis of the sponge for almost half its depth, and then appears to divide into several branches. The sides of the sponge form thick dense walls to the cylindrical canal, which is of uniform diameter before its division.

In its present condition the sponge is of a light brown hue. Its surface exhibits an intricate interlacement of stellate, siliceous spiculæ, including a tissue of finer spiculæ of the same character, the whole associated by the dried remains of the softer sponge tissues. More or less fine sand, especially at the lower end of the sponge appears to be introduced as an element of structure.

From the lower end of the sponge there projects a number of distinct or separate tufts of siliceous spiculæ, looking like tufts of blonde human hair. In the specimen there are fifteen tufts projecting around two-thirds of the extremity of the sponge, but the remaining third of the extremity of the latter exhibits about ten orifices, from which as many additional tufts appear to have been extracted.

Length of the body of the sponge $4\frac{1}{4}$ inches; diameter at middle 22 lines, at lower end 15 and 17 lines, at upper end 8 lines. Length of tufts of spiculæ 2 inches. The coarser stellate spicules of the surface of the sponge in general have five rays, of which four are irregularly cruciform, while the fifth projects at a right angle to the others towards the interior of the sponge. The rays of the contiguous crosses form together a lattice work on the surface of the sponge, and the intervals are covered by the rays of the finer spiculæ which also in general have a five-rayed stellate character. The finer tissue in the interior of the sponge, seen through the lattice work of the surface, contains a multitude of spicules which differ from the others only in their minute forms. Some of the largest stellate spicules on the surface of the sponge have a stretch of three-fourths of an inch.

The spicules of the tufts projecting from the sponge are two or three inches in length and vary in diameter. They become attenuated towards both extremities, but especially that inserted into the sponge-mass. Starting from the latter, they are at first smooth, then finely tuberculate; the tubercles gradually become converted into well marked recurved prickles or hooks, and finally the spicules end in a pair of longer hooks, recalling to mind the arms of an anchor. The spicules bear a near resemblance to those at the lower extremity of *Euplectella*, but have only two instead of four hooks at the end. In the specimen but few of the spicules present the complete character as described, most of them apparently having been broken.

The object of the tufts of spicules with their recurved prickles, and anchor-like free extremities, in *Pheronema* would apper to be to maintain the position or preserve the anchorage of the sponge in its ocean home, and perhaps in the living animal they are incessantly produced as occasion may require, just as a *Mytilus* or a *Pinna* renews and attaches its threads of byssus to secure its position.

The siliceous spicules of *Pheronema* are composed, as in sponges generally, of concentric layers, and exhibited a delicate tubular axis. A spicula from one of the tufts measured as follows:—

Spread of the anchor one-tenth of a line; shank of the anchor one-thirtieth of a line; prickled portion of shaft one-fortieth of a line; shaft where thickest and without prickles one-eighteenth of a line, thinning out to the inserted end where it was not more than 1-300th of a line.

The species I propose to dedicate to my wife under the name of *Pheronema Annæ*.

Dr. Leidy fur ıremarked, that if any of the members desired to examine

Euglena viridis, he had observed it in great profusion on Friday last in a ditch skirting the Delaware road below the coal oil depot, south of the built portion of the city. The water looked in the spot as if Schweinfurt green had been strewed on the surface. He also exhibited drawings of a species which appeared to be an undescribed one, and which he had several times noticed late in the spring and early summer some years ago. The drawings were made from specimens obtained in a pond near Gloucester, N J., in May, 1858. The water of the pond was thickly coated with a ferruginous red color due to the *Euglena*. The infusorium is not of a blood-red hue, as is stated to be the case in *Euglena sanguinea*, but is of a uniform ferruginous red. Upon keeping the animalcule a few days in a glass vessel exposed to the northern light, the exterior of the contents assumed a bright green hue, and the red eye point, previously invisible, came into view, while the central mass of contents remained of the original color. The animalcules remained in this condition subsequently until they died. In motion the animalcule assumed the various forms observed in *E. viridis* and other species. It would elongate to about 1-15th of a line by the 1-75th of a line wide. In the resting condition assuming a globular form, it measured 1-37th of a line in diameter.

The head is obtuse; the mouth oblique; the tail acute, and the flagellum is about the length of the body. Generally two nucleus-like vesicles occupied the interior, besides a clearer space around the position of the eye-point.

Dr. R. W. Hargadine exhibited some beautiful crystals of hæmatocrystallin, prepared by himself after the method of Bojanowski, who takes a quantity of blood drawn from a vein, or better from the blood vessel of an animal after death, and places it from two to four days in a cool place, until the blood corpuscles begin to form a thick, dark red, or black mass. A drop of this fluid is placed on a slide, covered, and placed in a dark place for several hours, when the crystals begin to form.

Dr. Chas. H. Thomas was elected a member of the Department.

Oct. 19*th*, 1868.

Director, Wm. Pepper, M. D., in the Chair.

Twenty-two members present.

Dr. H. C. Wood, Jr., called the attention of the Department to the manner in which one of the plant inhabitants of the ditches below the city produces its *zoospores*. The plant in question is filamentous, and grows in great numbers attached to twigs, bits of dead grass, splinters of wood, &c., in stagnant or partial stagnant water.

At its maximum size it is very apparent to the unaided eye, and is of a dark green or even blackish color. Such large filaments are perfectly opaque and are composed of numerous cells. The base of the filament is narrowed, and at irregular intervals in its length there are very marked contractions. The younger filaments are uniform and composed of a single series of cells. The *zoospore* is of the ordinary conical form, with the usual transparent space at the smaller end, from which arise three long cilia. The living *zoospore* soon becomes attached by its pointed end to some support, its cilia withering away, and commences to elongate at the expense of its transverse diameter. At the same time it acquires a cellulose coat. After a while the cell thus formed divides transversely into two. Growth continuing, each of these cells after attaining a certain size, again divides transversely, and so the process goes on, until finally a long filament is produced, which is composed of a single series of cells placed end to end. When this filament has reached a certain stage of development, one of two things occurs, either the cells begin to divide in the direction of their length, or the production of *Zoospores* takes place. In the first instance each cell

divides into two, four, &c., cells, so that in the filament a number of cells lie side by side, and from this compound filament the large matured trichoma is formed by a continuation of growth and division. The *zoospores* are formed only in the younger fronds, these old compound trichomata appearing to be incapable of developing them. The endochrome in a cell about to produce *zoospores* divides into several more or less irregularly globular or pyriform masses. This change takes place almost simultaneously in a number of consecutive cells. The walls of the cells now undergo some alteration, whereby they become soluble in water. And as the division of the endochrome occurs first in the most distant cells of the filaments, so does also this change in the cellulose coats. Solution of the walls now takes place, the partitions between the cells disappearing, and the outer walls opening out, separating from one another. At the same time the *zoospores* begin to move uneasily, rolling on themselves, pushing forward, &c., and soon make their exit in a long stream which issues from the end of the filament.

This plant appears to be the same as that described by Kützing under the name *Schizomeris Leibleinei*. No European observer has, however, as yet noticed the manner in which the latter produces its *zoospores*, and therefore it is impossible to be certain in the identification. If *S. Leibleinei* should be found to differ essentially in the mode of giving birth to *zoospores* from the American species, the latter will form the type of a new genus.

For the present it seems better, however, to consider the two identical.

Jno. Tomes, F. R. S., London, was chosen a corresponding member of the Department.

Nov. 2d, 1868.

MR. CHAS. BULLOCK in the Chair.

Twenty-six members present.

Mr. T. W. Starr presented to the Department twelve slides, illustrating the anatomy of miscellaneous insects, among which is the seventeen-year locust.

Nov. 16th, 1868.

Director, WM. PEPPER, M. D., in the Chair.

Twenty-six members present.

Mr. W. H. Walmsley donated twelve slides illustrating vegetable structure.

Dr. F. W. Lewis donated slides of miscellaneous objects.

DR. WOOD exhibited to the Department fruiting specimens of a fresh-water *Alga*, which he had found near Chelten Hills, Montgomery County, growing in a rapidly flowing creek, on stones, which it covered more or less completely with a dark purplish, mucous coating. He stated that it might be referred, with some doubt, to the European plant, *Chantransia chalybea*, from which it differs, however, in its habit of growth, as well as in the filaments being much thicker and nearly twice as long. He gave the measurements of the oval spores as about $\frac{1}{375}$ in the transverse, by $\frac{1}{250}$ in the long diameter. The diameter of the filaments is about the $\frac{1}{250}$ of an inch.

The doctor also exhibited specimens of a new species of *Palmella*, collected on the banks of the Schuylkill above Manayunk, which grew on the faces of rocks, kept constantly wet by dripping spring water. He proposed for the plant the name of *Palmella Jesseni*, after Prof. Jessen, of Prussia, and gave the following specific description of *P. Jesseni*, n. sp.

P. thallo expanso, initio dilute aut læte viride, molle, pellucidulo, ætate

provecta firmo, tuberculoso, saturate olivaceo viride; cellulis globosis vel ellipticis, in thalli ætate immaturo plerumque singulis aut geminis et sæpe sparsis, in thallo maturo sæpe in familias counexis, plerumque confertis; thalli maturi tegumentis plerumque distinctis, thalli immaturi plerumque diffluentibus.

Diam. cell. glob. max. $\frac{1}{500}$

Cell. oblong. long. max. $\frac{1}{250}$

Dr. Samuel Lewis was chosen a member of the Department.

Dec. 7th, 1868.

Vice Director, J. G. HUNT, M. D., in the Chair.

Twenty-five members present.

Dr. F. W. Lewis presented to the Department a microscope, with box, bull's eye condensed, two eye pieces and three objectives, including 1 in., $\frac{1}{8}$, and $\frac{1}{12}$, for which the thanks of the Department were formally rendered.

S. Weir Mitchell made the following remarks upon the general resemblance in the effects caused by the venom of the various genera of poisonous serpents.

Several years ago, I reached the conclusion that the bite of the European viper and that of our own rattlesnake, produced identical symptoms. Since then I have been able, from experiments, to extend this conclusion to the copperhead. A very close study of Russel's experiments upon the East Indian snakes, particularly the cobra, and a like analysis of the results obtained by Guyon in Africa, and Rufz in Martinique, make it probable that all the serpents studied by these observers occasion symptoms which are so much alike as to make it impossible from these alone to state which snake inflicted the wound. The difference is one of degree and never one of kind.

Several months ago I received from Dr. Halford, of Victoria, Australia, a paper on venom poisoning. In replying, I enclosed a dried specimen of rattlesnake poison, with which he made comparative experiments. These appear to confirm the resemblance between the cobra and our own serpents At the same time Dr. H. states that the tiger-snake differs from the cobra in that its venom occasions but trifling or no local symptoms. He also adds that after death from this serpent's bite, the body does not putrify quickly, but is rather preserved thereby from decomposition. This seems to me so remarkable—so exceptional indeed—as to make it very desirable to have it set beyond doubt by further experiments. Apart from this single case, the identity of all known snake poisons seems to be well established.

Dr. J. G. Hunt exhibited an entire pitcher of the Nepenthes Distillatoria, prepared to show the situation of the previously undescribed glands, to which he some months ago called the attention of the Department.

Dr. L. S. Bolles exhibited a new clinical microscope, constructed by Mr. Tolles, of the Boston Optical Works, on a plan proposed by Dr. Cutter of Mass. The microscope possessed a one-fifth objective, and resembled somewhat the tubular part of Dr. Beale's clinical microscope. It was, however, provided with a *screw* movement for the adjustment, which secured a smooth and sufficiently rapid approximation of the object glass towards the object, without the disadvantages so evident in the sliding movement of a tube within a tube. It was unprovided, however, with any special means of illu-

mination, being intended to be used with diffused daylight, or directed towards a source of artificial illumination.

At the annual election for officers held this evening, the following were chosen:—

Director, S. W. Mitchell, M. D.
Vice Director, Wm. Pepper, M. D.
Recorder, James Tyson, M. D.
Corresponding Secretary, J. H. McQuillen, M. D.
Conservator, Herbert Norris, M. D.
Treasurer, C. N. Pierce, D. D. S.

Dec. 21st, 1868.

Director, S. W. MITCHELL, M. D., in the Chair.

Twenty members present.

Dr. J. H. McQuillen exhibited, in further illustration of his previous communication, slides of blood corpuscles of men and lower animals to which chloroform and nitrous oxide had been administered, to show that there was no morphological change in these bodies after administration of anæsthetics, as contended for by B. W. Richardson, Sanson and others. The doctor also exhibited slides of blood corpuscles with which chloroform and ether had been brought in actual contact, producing under these circumstances actual disintegration. Dr. McQ. believes that the anæsthetics act primarily upon the nervous centres, as early contended for by Flourens and the French physiologists generally.

MR. W. H. WALMSLEY called the attention of the Department to the very great merits of Glycerine jelly as a medium for preservation of every description of objects, animal or vegetable, and exhibited specimens of both. I was led to experiment with it about one year ago, owing to the unsatisfactory results obtained from the use of balsam in many classes of objects, its high refracting power rendering many delicate tissues invisible, which are seen perfectly in the jelly. At first I was not very successful, having followed the formulæ of Davies and other English authorities in making it; the intense heat of our early summer liquified it, and spoiled many specimens. After many experiments, I arrived at a satisfactory result, the fluid readily jellying in an hour or two during the hottest days of August.

The advantages of this medium I deem to be various and obvious, and that it combines within itself more than are possessed by any other with which we are as yet acquainted. Its preservative qualities I believe to be unsurpassed, for nearly every description of tissues or structure, animal or vegetable; it preserves the colors of the latter in absolute perfection, it is very readily prepared and used, it attaches the covering glass to the side with sufficient tenacity for all practical purposes, whilst the finishing ring of varnish will render it quite secure. It is equally available for objects requiring to be mounted in deep cells, and there is no danger of leakage, as is the case with all fluids; it can be readily removed from slide and cover with hot water, if necessary. The refractive powers of the glycerine are sufficient to render all inert structures transparent, whilst even the delicate lines upon the scales of a mosquito's wing, are as distinctly visible as though mounted dry.

Finally, I desire, in bringing the subject before the Department, and mentioning my experience with its use, to interest other members in the matter, to induce them to try it, and to bring together from time to time the results we may severally arrive at. For I conceive it to be almost as important to arrive

at a means of *preserving permanently* objects suitably prepared for scientific observations, as to be able to prepare them for such observation without reference to their preservation. Since we can only hope to arrive at accurate conclusions by repeated study, not by one, but many observers, this can only be done by having the object suitably prepared and permanently preserved.

The formula for making glycerine jelly is as follows:

Take one package of Cox's gelatine, wash repeatedly in *cold* water, then place in a vessel and add sufficiently *cold* water to cover it. Allow it to soak an hour or two, pour off superfluous water, add one pint of *boiling* water, place vessel on fire and boil for ten or fifteen minutes. Remove from fire, and when cool, but still fluid, add the white of an egg, well beaten, replace on the fire and boil until the albumen of the egg coagulates. Strain while hot through flannel, and add an equal portion by *measurement* of Bower's pure glycerine, and fifty drops of carbolic acid in solution; boil again for ten or fifteen minutes, and again strain through flannel, place in water bath, and evaporate to about one-half, then filter into two oz. broad-mouthed vials. (Cotton is the best filtering medium.)

To use the jelly in mounting objects:—Place the stock bottle in a small jar of boiling water; when it becomes fluid, a sufficient quantity must be removed to the slide (previously warmed), with a glass rod; the object, (previously soaked for some hours in equal parts of glycerine and distilled water, with a few drops of alcohol,) is to be placed in the drop of fluid jelly, a cover applied and slight weight placed upon it to exclude superfluous jelly. When cold, clean off the slide with a knife and wash in cold water; finish with a ring of gold size or shellac varnish.

NOTE.—Dr. Carpenter cautions against use of Glycerin with objects of a calcareous nature, as it is a solvent of carbonate of lime.

Mr. Chas. Bullock remarked that it is important to give the gelatine frequent washings previous to use, to remove traces of sulphuric acid, which invariably remain from the process employed in its preparation.

Mitchell W. McAllister, S. Fisher Corlies and Dr. J. G. Richardson, were this evening chosen members of the Department.

Prof. O. W. Holmes, of Boston, was chosen a corresponding member.

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